

LILJEBORGIID AMPHIPODS FROM THE GULF OF MEXICO AND CARIBBEAN SEA

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ABSTRACT

The family Liljeborgiidae is represented in the Gulf of Mexico and Caribbean Sea by two genera and five species. One species, *Listriella barnardi* Wigley, 1963, has previously been described from the east coast of North America. The remaining four species, *Liljeborgia bousfieldi*, *Listriella quintana*, *Listriella bahia*, and *Listriella carinata* are described as new species. *L. bousfieldi* appears closely related to the Hawaiian liljeborgiids while the listriellas appear more closely related to the east coast members of their genus.

The family Liljeborgiidae is represented in the Gulf of Mexico and Caribbean Sea by two genera and five species. Only one of these, *Listriella barnardi* Wigley, 1963, has been previously described and its occurrence in the Gulf of Mexico is being reported here for the first time. One new species of *Liljeborgia* Bate, 1862, and three new species of *Listriella* J. L. Barnard, 1956, are described as new.

Little is known about the members of this family in the Gulf or Caribbean, especially *Liljeborgia*. Although some 28 species have been described, most are bipolar and amphiboreal (Barnard, 1959). The genus, however, is not restricted to these regions as indicated by the new Caribbean species described here and other reports (Barnard, 1970; Krapp-Schickel, 1974).

The species of *Listriella* are only slightly better known as commensals in polychaete tubes of shallow bay and nearshore bottoms. Barnard (1959) reported five species from California and Bousfield (1973) reported two species from New England waters. Both authors indicated that the various species were associated with tube-dwelling worms. The presence of a number of species of *Listriella*, particularly in the Gulf of Mexico, would be expected because of the well developed polychaete fauna (Harper, 1970).

ILLUSTRATIONS

The coding system used in the figures is that of Barnard (1970). Capital letters designate a specific structure. Lower case letters preceding the capital identifies a specific individual. Lower case letters or numbers following the capital modifies the description of the part. All other letters are explained in the appropriate figure legend. B = labrum (upper lip), C = coxa, G = labium (lower lip), H = head, L = palp, M = Mandible, N = gnathopod, O = outer plate or ramus, P = pereopod, Q = mandibular molar, S = maxilliped, T = telson, U = uropod, V = urosome, W = pleon, X = maxilla, Z = mandibular incisor; d = finger hinge, f = female, h = holotype, l = left, n = palmer corner, o = opposite or other side, p = dorsal, q = one-half, r = right, w = palm, x = medial, y = article.

Liljeborgiidae

Diagnosis.—Accessory flagellum 2 or more articulate; molar of mandible poorly developed, non-tritulative; rami of uropod 3 lanceolate; telson deeply cleft.

Liljeborgia Bate, 1862

Iduna Boeck, 1861 (homonym); *Liljeborgia* Bate, 1862; *Microplax* Liljeborg, 1865 (homonym); *Liljeborgiella* Schellenberg, 1931

Diagnosis.—Posterior lobe of article 5 on gnathopod 2 prolonged behind article 6.

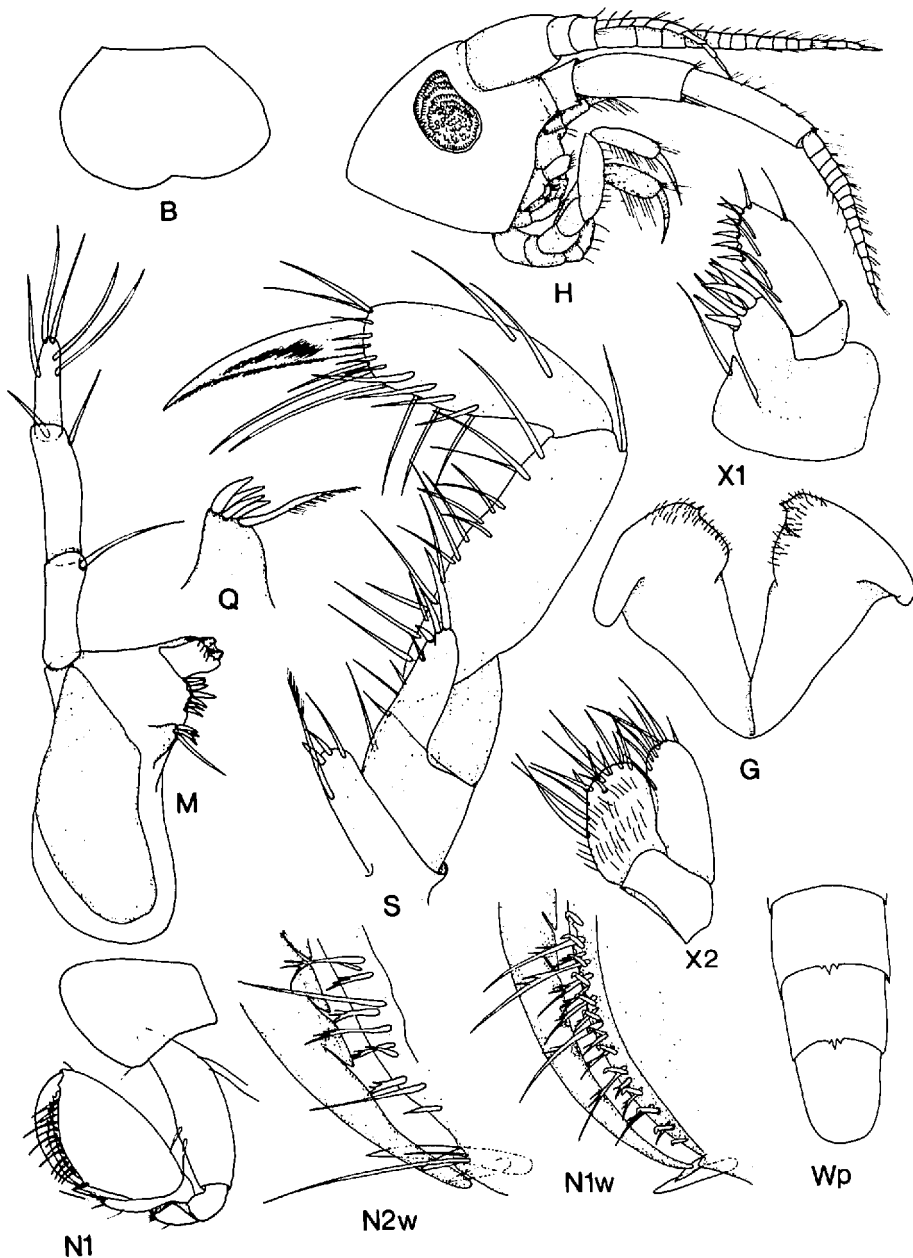


Figure 1. *Liljeborgia bousfieldi* new species, male 3.66 mm.

Liljeborgia bousfieldi new species
Figures 1, 2

Description of Male.—3.66 mm. Head normal for genus; ommatidia well defined, coalesced, reniform; anterior head lobe produced forward, quadrate; dorsal surface of pleonal segments 1 and 2 with 3 denticles each, 1 larger tooth between 1 shorter subequal teeth; dorsal of body otherwise noncarinate; no pigmentation

observable due to preservation. Antenna 1: Shorter than antenna 2, slightly exceeding peduncular articles of 2; article 1 of peduncle 1.4 times combined length of subequal articles 2 and 3; flagellum with 16 articles; accessory flagellum with 10 articles, 0.6 times as long as flagellum. Antenna 2: Peduncle article 4 slightly shorter than 5 with 1 distoventral spine; flagellum with 15 articles, 0.7 times the length of the peduncular segments. Upper Lip: Broad, unevenly bilobed. Mandible: Molar vestigial, with 4 subequal spines and 1 elongate accessory spine, 7 accessory blades; lacinia mobilis with 6 teeth, slightly more elongate than broad; incisor with distal edges medially rolled inward; palp 3-articulate, article 2 longest, article 1 with 1 ventral seta, article 2 with 2 distal setae, article 3 shorter than others with 5 apical setae. Lower Lip: Lacking inner lobes; outer lobes widely separated. Maxilla 1: Inner plate reduced, with 1 apical seta; outer plate with simple spine teeth; palp twice as long as outer plate, basal article of palp 0.3 times as long as article 2, article 2 with 6 distomedial and single lateral spines plus oblique row of 5 facial setae. Maxilla 2: Inner plate wider than outer, distal half of medial edge lined with setae, additional row of short apical setae also present, facial surface covered with hair-like setae; outer plate with apical setae; length of plates subequal. Maxilliped: Inner plate reduced, 2.7 times as long as wide, with 1 elongate medial seta, 3 apical spines; outer plate reduced, 3 times as long as wide, 3 apical spines; palp greatly enlarged, dominating plates, medial edge of palp article 2 lined with setae, article 3 with 2 mediolateral setae, numerous medial and distal setae, article 4 elongate, 0.9 times as long as article 3, medial edge and face with hair-like setae. Gnathopod 1: Powerfully subchelate; coxa unproduced, anterior edge more elongate than posterior; article 2 with 2 posterior, 2 anterior setae; article 5 posterior lobe produced distally, linear, with distal setae, palm oblique, posterior edge defined by 2 spines, palm with 2 rows of complex setae, branched and hooked; article 7 extending length of palm, inner margin crenulate over half its length. Gnathopod 2: Powerfully subchelate; coxa of less area than coxa 1; posterior margin of article 2 with 3 elongate medial setae, numerous distal setae; article 5 posterior lobe produced distally, linear, setose distally; palm of article 6 oblique, defined posteriorly with 3 spines, 2 rows of setae along palm, simple and branched; inner margin of article 7 crenulate; gnathopod 2 larger than gnathopod 1. Pereopod 3: Coxa with anterior distal edge oblique, posterodistally produced; article 2 linear; articles 4 and 5 linear, successively shortened; article 6 one and a half times longer than article 5, distally expanded, posterior spine formula—1,1,1,1,1, and 1 locking spine; article 7 somewhat elongate, 0.4 times as long as article 6. Pereopod 4: Coxa much larger than preceding ones, excavate posteriorly; otherwise similar to pereopod 3. Pereopod 5: Coxa bilobed; article 2 broadly expanded, posterior margin crenulate, outer margin with 4 spines, 2 distal spines; remaining articles linear; article 3 with 1 distal spine; article 4 with 2 posterior marginal spines, 2 distal spines on either margin; article 6 anterior spine formula—1,1,1,1,1, and 1 locking spine; article 7 attenuate, elongate, 0.6 times as long as article 6. Pereopod 6: Coxa with posterodistal corner produced; article 2 broadly expanded, posterior margin crenulate, anterior margin with 6 spines, 2 distal spines; remaining articles linear, article 3 with 1 distal spine; article 4 with 1 anterior, 3 posteromarginal spines, 2 distal spines on either margin; article 5 with 2 marginal spines; anterior margin setose, article longer than preceding ones except article 2; article 6 with anterior spine formula—1,1,1,1,1, and 1 locking spine; article 7 attenuate, elongate, 0.6 times as long as article 6. Pereopod 7: Coxa similar to coxa 6, corners unproduced; article 2 broadly expanded, 1 proximal ridge on anterior corner, posterior margin crenulate, anterodistal margin with 5 spines, 2 distal spines; article 3 with 1 distal

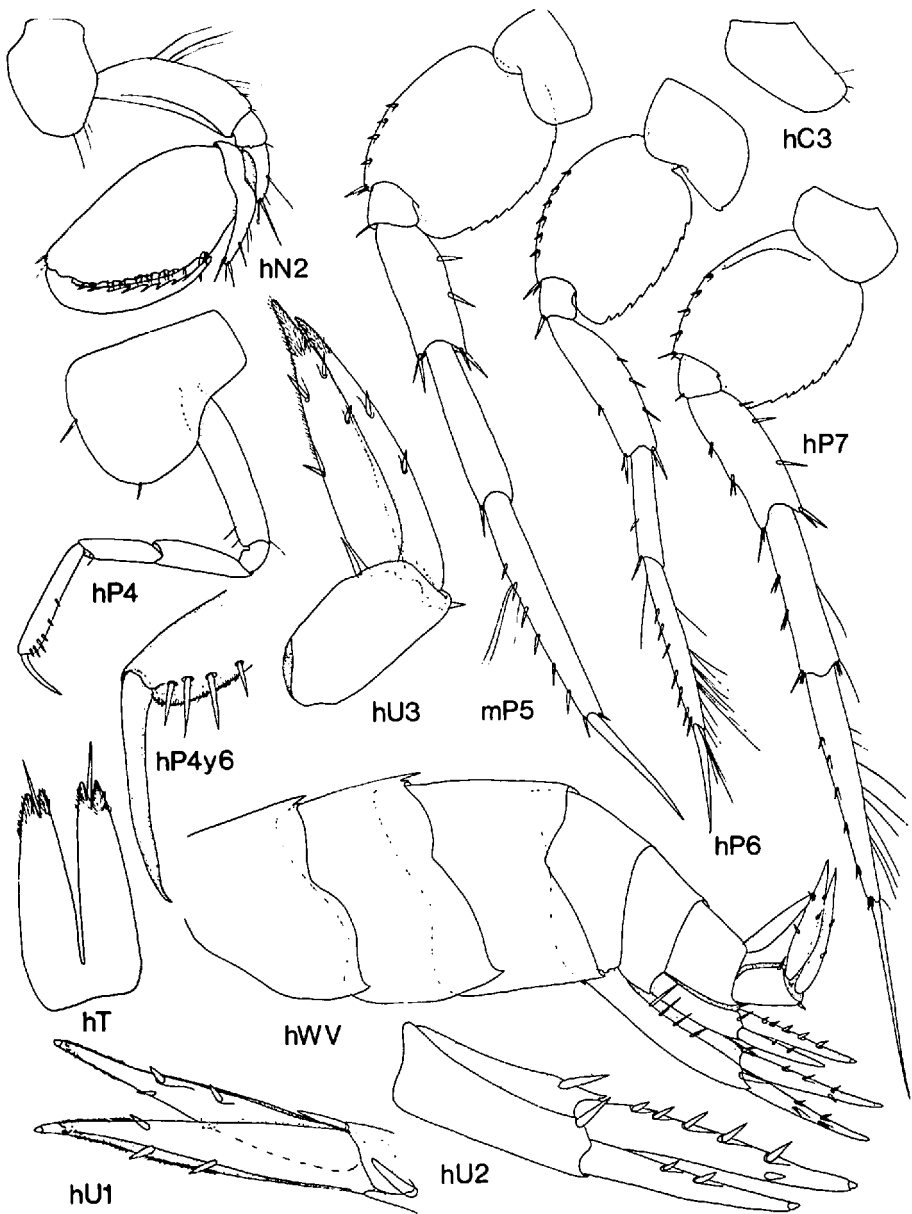


Figure 2. *Liljeborgia hounsfieldi* new species, male 3.66 mm = h. *Liljeborgia hounsfieldi* new species, male 5.10 mm = m.

spine; article 4 with 3 posterior and 2 groups of anterior spines, 2 distal spines on either margin; article 5 with 2 groups of anterior marginal spines, 2 distal groups on either margin; article 6 with anterior spine formula—1,1,1,1,1, and 2 locking spines; article 7 attenuate, extremely elongate, 0.8 times as long as article 6, pereopod 1.2 times the length of pereopod 6. Epimera: Plates with posterior margins sinuous; 3 broader than preceding ones. Uropod 1: Longer than uropod 2 or 3; peduncle longer than rami, outer margin with 4 successively shortened

spines, inner and outer distal corner with spur; inner and outer rami subequal in length; inner ramus with 2 outer marginal spines, 1 inner; outer ramus with 2 outer, 2 inner marginal spines; both rami covered with fuzz apically, terminated with accessory nails. Uropod 2: Peduncle shorter than rami, inner and outer margin with 1 distal spine each; inner ramus slightly longer than outer, inner ramus with 5 inner and 1 outer spines; outer ramus with 2 marginal spines; both rami with accessory nails. Uropod 3: Peduncle short with a spine on either distal corner; rami lanceolate, subequal, longer than peduncle; inner ramus with 3 inner marginal, 2 outer marginal spines, apex with fuzz; outer ramus with 2 marginal spines, apex with fuzz. Telson: Deeply cleft, tips bifid with 1 spine on each lobe, lobes with apical fuzz. Gills: Present on all pereopods except 1 and 7.

Types.—Holotype, USNM 170227, male 3.66 mm, with one paratype: male, 5.1 mm, USNM 170228.

Type-Localities.—Station 41-60, Smithsonian-Bredin Expd. IV, 1960; Espiritu Santo Bay, Quintana Roo, Mexico, April 6, 1960.

Material Examined.—The holotype and specimens from Station 41-60.

Distribution.—Yucatan, Mexico, Caribbean Sea.

Relationships.—This species is closely related to *L. heeia* Barnard, 1970, and *L. laniloe* Barnard, 1970. It more closely resembles *L. heeia* in having article 7 of pereopods 3 and 4 distally expanded and similar epimeral plates. Refer to following key to distinguish these species.

Ecological Remarks.—The type specimen was taken in shallow water, 0.5–3 m depth along the flank of a reef among eroded coral in Espiritu Santo Bay. Other specimens were taken on reef flats in Ascension Bay near Suliman Point.

PARTIAL KEY TO *Liljeborgia*

- 1a. Pleonites 1–2 with 3 dorsal denticles each 2
- 1b. Pleonites variously denticulate, never with only 3 dorsal denticles on each of pleonites 1–2 other *Liljeborgia*
- 2a. Pereopods 3–4, article 7 expanded (palmate) distally 3
- 2b. Pereopods 3–4, article 7 not expanded distally *L. laniloe*
- 3a. Inner ramus of uropod 3 with 2 spines on outer margin, 1 on inner margin, uropod 2 outer ramus with 3 spines, palmate portion of article 7 on pereopods 3–4 produced into tooth on posterior corner *L. heeia*
- 3b. Inner ramus of uropod 3 with 2 spines on either margin, uropod 2 outer ramus with 2 spines, palmate portion of article 7 on pereopods unproduced (rounded) *L. bousfieldi*, n.sp.

Listriella J. L. Barnard, 1959

Diagnosis.—Posterior lobe of article 5 on gnathopod 2 not prolonged behind article 6.

KEY TO SPECIES OF *Listriella*

Limited to those occurring in the Gulf of Mexico and Caribbean Sea.

- 1a. Pereopod 7 spinose, heavy; dactyl short, stout 2
- 1b. Pereopod 7 moderately to poorly spinose, dactyl normal to attenuate 3
- 2a. Anterior head lobe produced; palm of gnathopod 2 somewhat excavate, corner defined by stout spine *L. bahia*, n. sp.
- 2b. Anterior head lobe not produced; palm of gnathopod 2 straight *L. clymenellae*

(*Listriella clymenellae* Mills, 1963, which is found on the east coast of North America from Cape Cod to Florida, is included because of its similarity to *L. bahia*.)

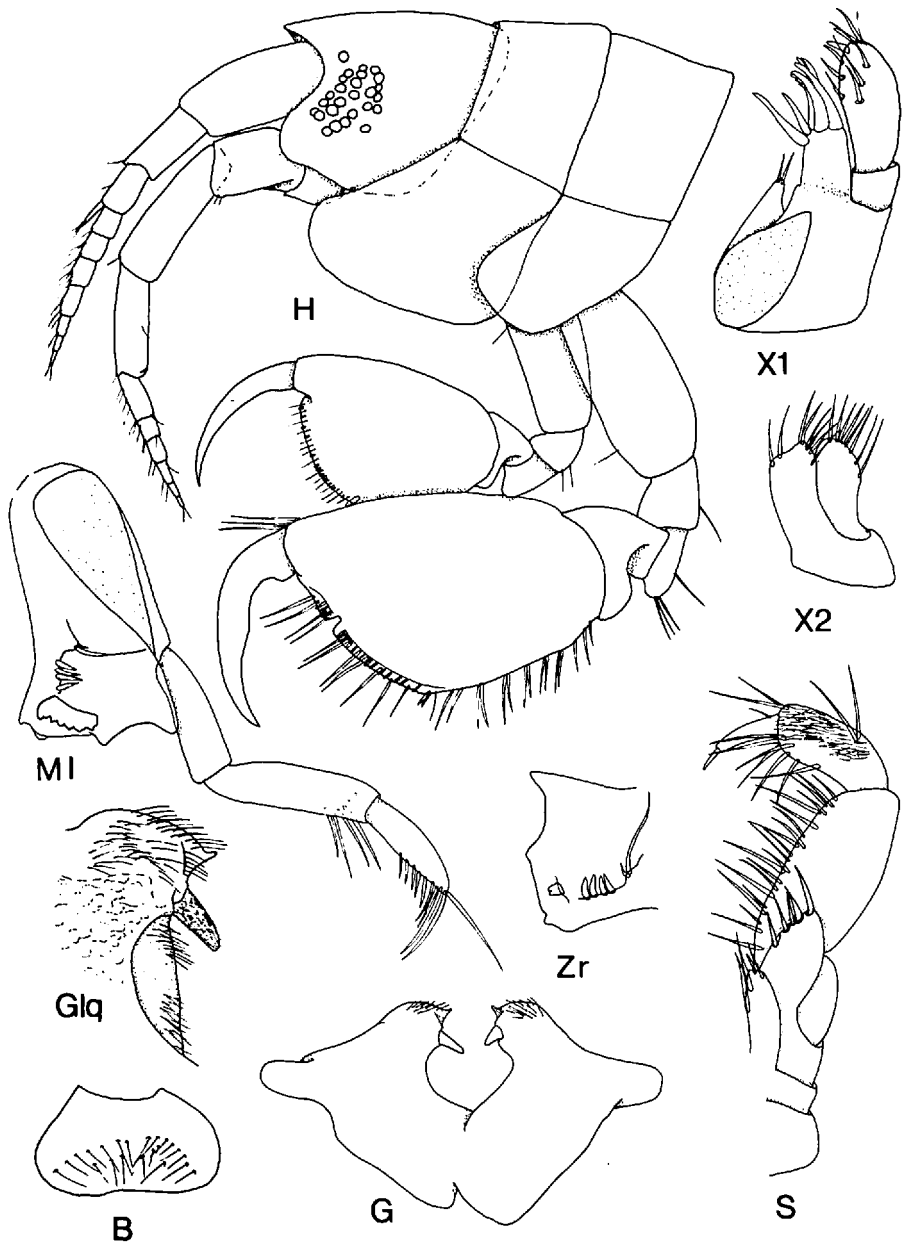


Figure 3. *Listriella quintana* new species, male 4.73 mm.

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|--|-----------------------------|---|
| 3a. Pleosome carinate; uropods and pereopods elongate, distal articles attenuate | <i>L. carinata</i> , n. sp. | 4 |
| 3b. Pleosome without carina; appendages of normal proportions | | 4 |
| 4a. Gnathopod 2 with medial palmar notch; posterior edge of epimeron 3 straight with distal notch; ommatidia loosely organized | <i>L. quintana</i> , n. sp. | |
| 4b. Palm of gnathopod 2 produced medially to a slight extent; posterior edge of epimeron 3 sinuous; ommatidia compact | <i>L. barnardi</i> | |

Listriella barnardi Wigley, 1963

Diagnosis.—Anterior head lobe acute; pereopod 7 poorly spinose; somewhat elongate; palm of gnathopod 2 produced medially somewhat; posterior margin of epimeron 3 sinuous; ommatidia compact.

Remarks.—See Bousfield, 1973, for description and plates.

Distribution.—Atlantic Ocean: Cape Cod to Georgia; Gulf of Mexico; North Texas Coast, 4–20 m.

Ecology.—Reported to be associated with various tube-building polychaetes (Bousfield, 1973). This species is common on soft bottoms from Galveston to Corpus Christi, and rarely in high salinity areas of Matagorda and Galveston Bays.

Listriella quintana new species

Figures 3, 4

Description.—Male, 4.73 mm. Head normal for genus, twice the length of first segment, ommatidia disjunct; body smooth, no carina, no pigmentation observed due to state of preservation. Antenna 1: Slightly shorter than antenna 2; peduncle segments decreasing in length, third article less than one half the length of first; flagellum with 7 articles, poorly setose; accessory flagellum with 2 articles. Antenna 2: Article 4 of peduncle longer than 5; flagellum with 6 articles, poorly setose. Upper Lip: Broadly bilobed with dense distal setae. Mandible: Molar process vestigial, a single hump with 1 elongate and 1 short setae, tritulative surface lacking; 4 short accessory blades present; left lacinia mobilis wider than long, with 6 distinct cusps, right lacinia mobilis reduced with 2 cusps; incisor simple, unproduced; distal portion of mandible broad, equal in extent to incisor; palp article 2 longer than either 1 or 3, distal portion of article with diagonal row of facial setae on lateral surface; article 3 with stout setae on distal portion of ventral surface to apex. Lower Lip: Inner lobes lacking, mandibular processes wide and only slightly downturned; shoulders of outer lobes with accessory medial processes below gland pores. Maxilla 1: Inner plate reduced with 2 apical setae; outer plate simple, lacking numerous complex apical spine teeth; palp article 1 one-tenth as long as article 2; article 2 with 3 facial setae and 7 distomedial and apical setae. Maxilla 2: Inner plate lined with setae along one-half its medial edge; outer plate subequal in length to inner; outer margin slightly produced with 2 setae, medial margin with 6 setae. Maxilliped: Inner plate reduced and narrow with 4 apical spines; outer plate with 5 medial spines; palp article 2 and 3 with medial setae, article 4 with accessory spine, distally covered with fine setae. Gnathopod 1: Coxa produced forward, much larger than coxa 2; gnathopod smaller than 2; subchelate; palm with margin entire, locking spine defining posterior border, gnathopod otherwise plain. Gnathopod 2: Coxa quadrate, slightly longer than wide; palm with medial notch and 2 locking spines defining posterior border; otherwise similar to gnathopod 1. Pereopod 3: Coxa quadrate with 2 posterior facial setae; article 2 with 3 anterior setae and 3 long posterior setae; remaining articles poorly setose; posterior margin of article 6 with spine formula of 1,1,1, and 1 locking spine. Pereopod 4: Coxa excavate posteriorly, much larger than coxa 3; remaining articles like those of pereopod 3. Pereopod 5: Article 2 expanded posteriorly, slightly crenulate, anterior edge armed with 5 spines; remaining articles poorly armed; article 6 with posterior spine formula of 1,1, and 1 locking spine; total length (excluding coxa) is 0.7 times as long as pereopod 6.

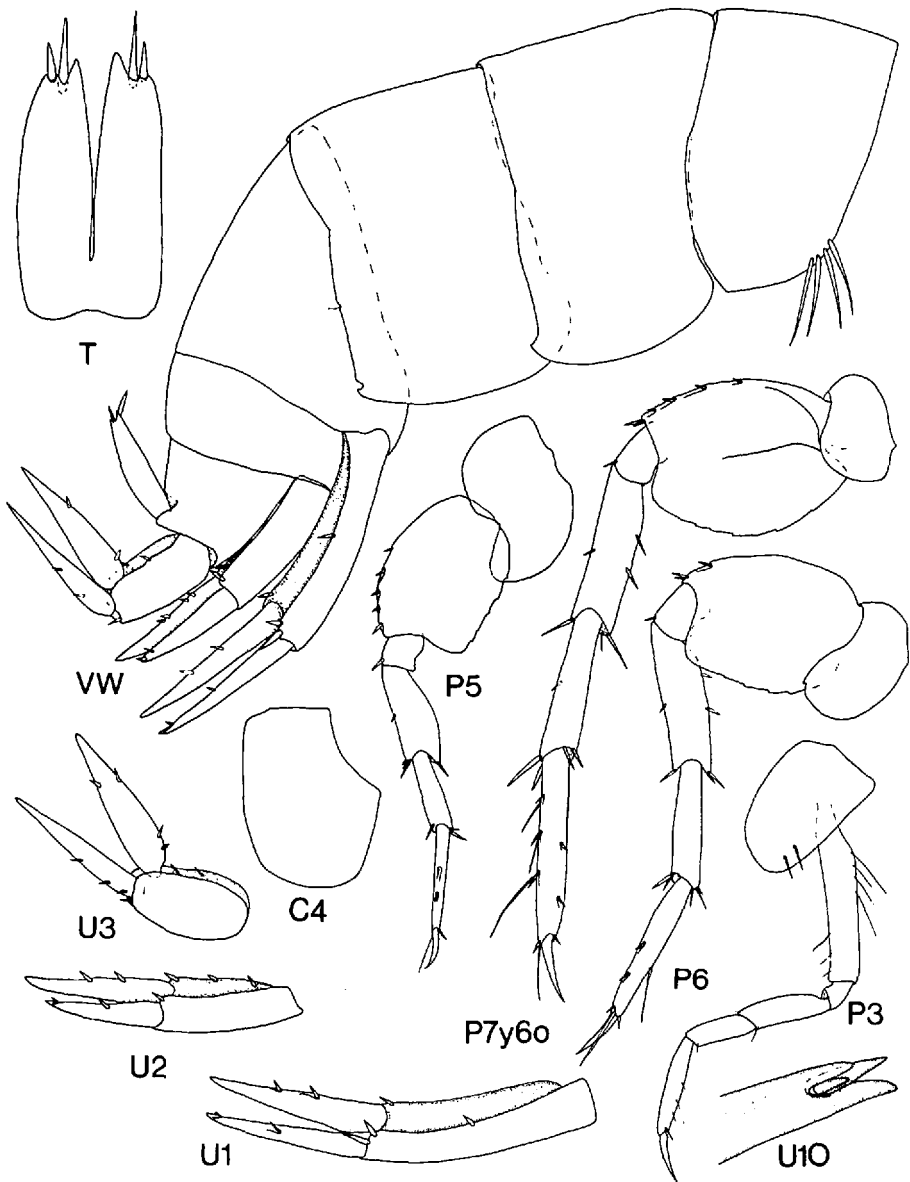


Figure 4. *Listriella quintana* new species, male 4.72 mm.

Pereopod 6: Coxa of less area than coxa 5; article 2 expanded, posterior margin slightly crenulate, anterior margin with 1 spine, 2 spines distally; remaining articles successively more elongate, poorly armed; article 6 with posterior spine formula of 1,1, and 1 locking spine; total length (excluding coxa) is 0.9 times as long as pereopod 7. Pereopod 7: Coxa of less area than coxa 5 or 6; article 2 expanded, 2 ridges traversing half its length, anterior margin with 4 spines, 2 spines distally; remaining articles successively more elongate than preceding ones, poorly armed; article 6 spine formula same as that of pereopod 6. Epimera: Plate 1 with 4 anterodistal, elongate setae; plate 2 slightly produced

posterodistally; plate 3, notched posterodistally, pleopods subequal in length, normal. Uropod 1: Peduncle 1.3 times as long as rami, inner margin with 1 distal spine, outer margin with 1 medial, 2 distal spines; rami subequal; inner ramus with 2 medial spines; outer ramus with 1 medial spine, tip bifurcate with 2 stout spines inserted in cleft. Uropod 2: Peduncle 0.6 times as long as peduncle on uropod 1, inner margin with 3 spines, outer with 1 distal spine; inner ramus 1.3 times longer than outer; both rami are otherwise armed as uropod 1. Uropod 3: Peduncle subovate, outer margin produced into ridge, inner margin with 2 spines, 1 basal spine; rami subequal, lanceolate; inner ramus with 3 proxiomedial spines; outer ramus with 3 inner margin and 1 outer marginal spines; rami carried at near right angle to peduncle. Telson: Deeply cleft, 1.7 times as long as wide, inner margin of tips produced distally, each lobe armed with 2 spines. Gills: Present and normal on all pereopods except 1 and 7.

Description of Female.—4.44 mm, similar to male in all respects except palm of gnathopod 2 lacking a medial notch.

Types.—Holotype, USNM 170229, male 4.73 mm, with one paratype: female, 4.44 mm, USNM 170230.

Type-Locality.—Station 28-60, Smithsonian-Bredin Expd. IV. 1960. Mujeres Island, Quintana Roo, Mexico, March 31, 1960.

Material Examined.—The types and specimens from station SB23-60.

Distribution.—Yucatan, Mexico—Caribbean Sea.

Relationships.—*Listriella quintana* appears very close to *L. barnardi* from the Gulf of Mexico and the east coast of North America. Both species have similar appendages and armament of the gnathopods. *Listriella quintana* differs in having a medial notch on the palm of gnathopod 3, the posterior edge of epimeron 3 is straight with a distal notch, and the ommatidia are loosely organized.

Ecological Information.—The type material was taken in a bay side inlet between two islands in eelgrass and in or near mangrove roots.

Listriella bahia new species

Figures 5, 6

Description.—Female 3.18 mm. Head with produced cephalic lobe, eyes with well developed but unconsolidated ommatidia; body otherwise normal for genus. Antenna 1: Stout, shorter than peduncle of second antenna; articles of peduncle successively shortened; flagellum with 5 articles; accessory flagellum with 2 articles. Antenna 2: Articles of peduncle stout, fifth article 0.8 times as long as 4; flagellum with 5 articles. Upper Lip: Wider than long, distal margin straight. Mandible: Molar reduced, nontritulative but with 3 distal spines; accessory blades 5 on the right, reduced in number on the left; lacinia mobilis present on the left only; incisor bilobed, inferior medial lobe half the length of the outer, bifid; palp with 3 articles of length ratios 29:40:36; article 2 with elongate medial setae, article 3 with short medial spines grading into longer terminal spines; article 2 geniculate. Lower Lip: Without inner lobes; outer lobes widely separated, outer process upright. Maxilla 1: Inner plate conical with 3 distal spines; outer plate with 7 spine teeth; base of palp with medial lobe; palp biarticulate, article 2 the longer with mediofacial and distomedial spines. Maxilla 2: Both plates with sparse distomedial setae. Maxilliped: With elongate ventrobasal setae; both inner and outer plates reduced with mediodistal setae; palp enlarged with 4 articles; article

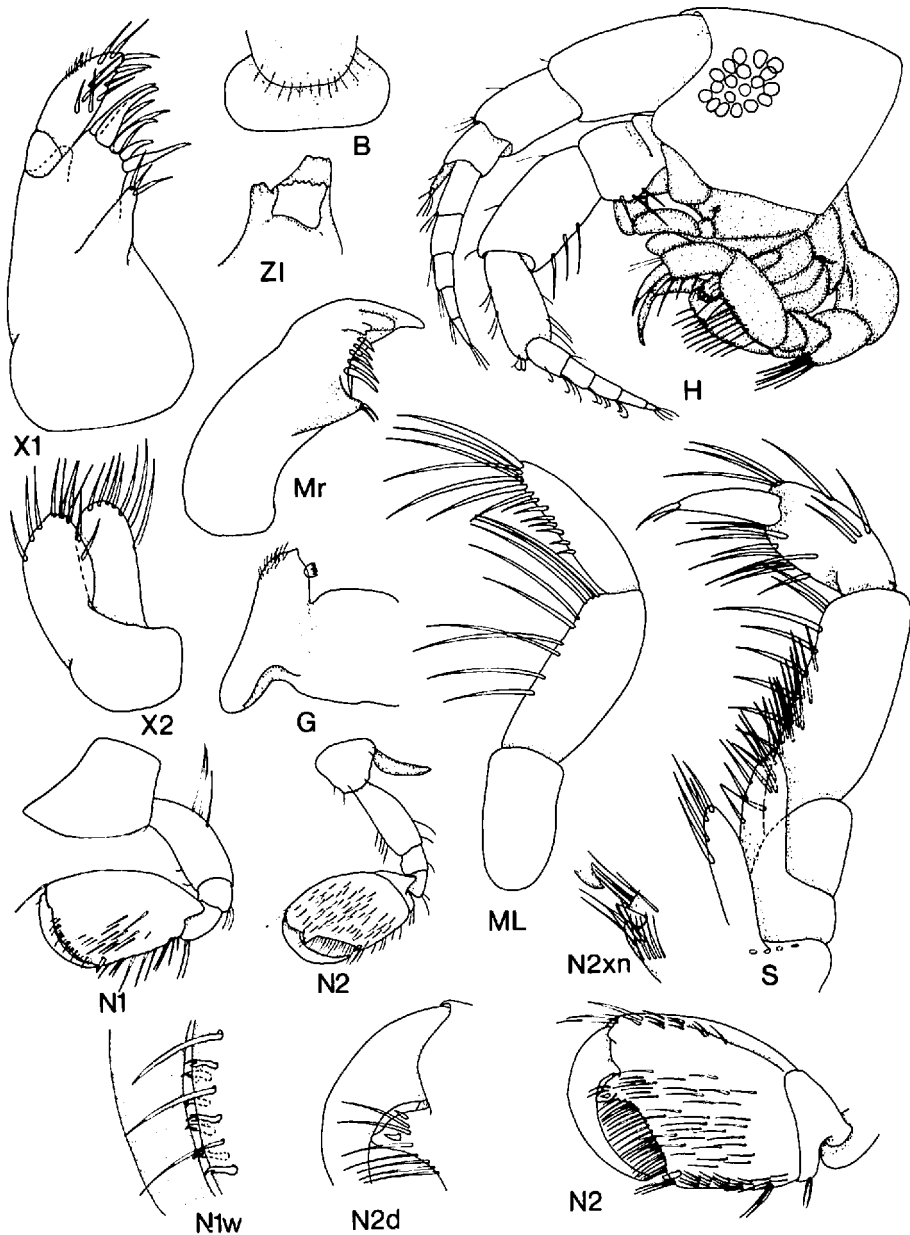


Figure 5. *Listriella bahia* new species, female 3.18 mm.

2 medially spinose, article 3 spinose, article 4 with accessory nail. Gnathopod 1: Coxa 1 produced anteriorly; article 6 distally expanded with mediofacial and ventromarginal setae; palm transverse lined with short bifurcate spines and short setae, corner defined by 1 stout spine; dactyl closing on corner. Gnathopod 2: Coxa distally narrowed; article 5 with distinct posterior lobe; article 6 with a row of antero- and posteromarginal setae and mediofacial setae; palm oblique, margin heavily setose with well developed finger hinge and lower corner defined with 1

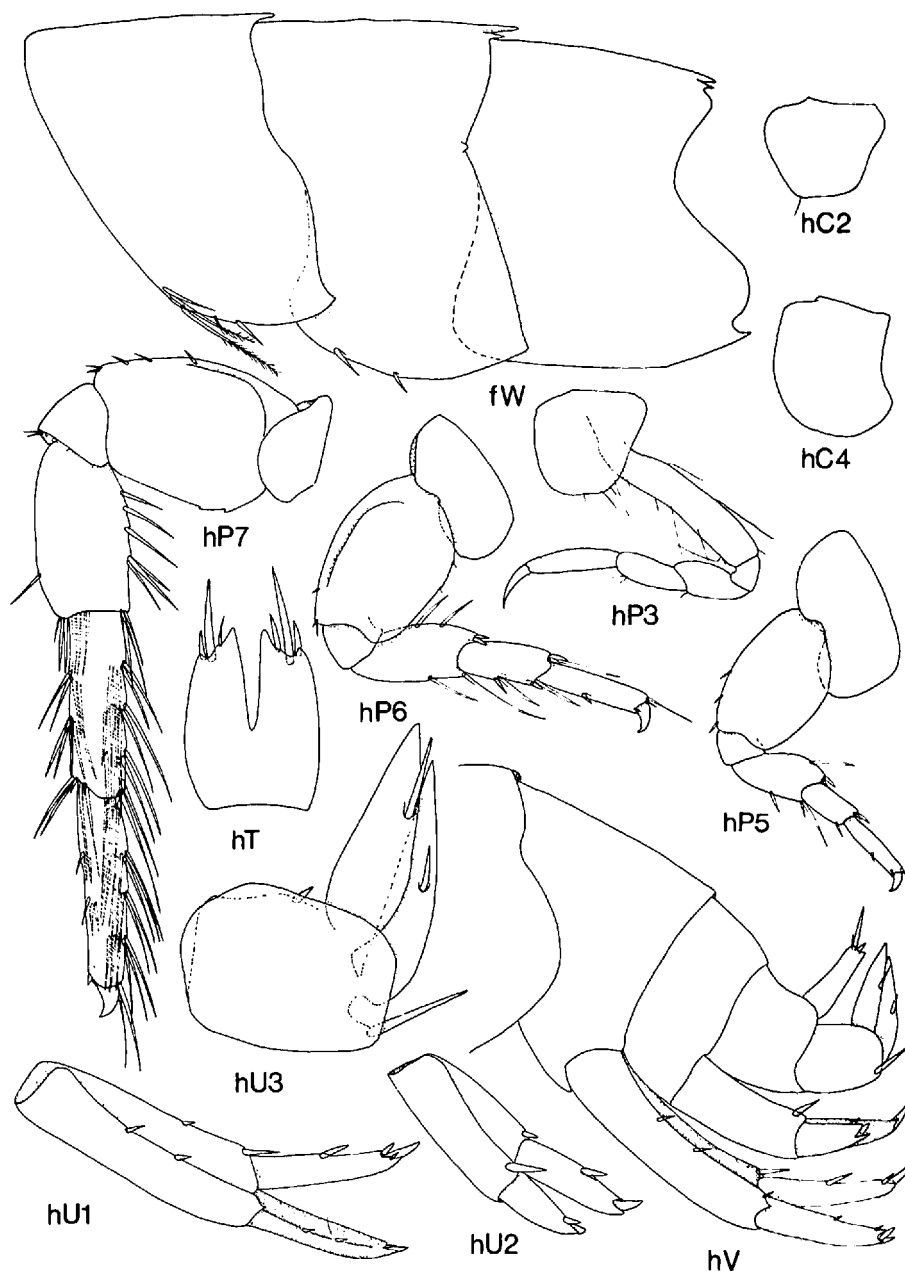


Figure 6. *Listriella bahia* new species, female 3.18 mm = h. *Listriella carinata* new species, female 3.25 mm = f.

stout spine; dactyl closing on finger hinge. Pereopod 3: Coxa quadrate; article 2 linear, elongate; remaining articles unarmed. Pereopod 4: Coxa slightly excavate posteriorly; pereopod otherwise similar to 3. Pereopod 5: Coxa wider than long, bilobed; article 2 expanded with 3 anteromarginal spines; articles 4 and 5 with posterodistal spines; article 6 with 2 anteromarginal and 1 posterodistal spines; length ratio of articles 4,5,6—12:10:15; dactyl short. Pereopod 6: Coxa wider than

long; article 2 expanded with anteromarginal ridge and 3 distal spines; article 4 with elongate anterior and posterior marginal spines and 2 stout posterodistal spines; article 5 with a group of 3 medial spines on posterior margin, distal edges with elongate setae, 2 stout posterodistal and 1 stout anterodistal spines; article 6 with 1 posteromedial spine and a single short locking spine; length ratios of articles 4,5,6—40:37:42; dactyl short. Pereopod 7: Coxa reduced, somewhat produced posteriorly; article 2 expanded with anteromarginal ridge and 5 anteromarginal spines, posterior margin with 2 serrations; article 4 with 3 single and 1 group of 3 stout, elongate spines and 1 anterodistal spine, distal edge with elongate spines; remaining article heavily spinose, distal edges also with short, stout spines; dactyl short; pereopod stout and elongate, 1.7 times as long as pereopod 7. Epimera: Epimeral plates rounded, unarmed. Uropod 1: Peduncle with distal edges somewhat produced, inner margin with 1 spine and 1 distal spur, outer margin with 2 medial spines; inner ramus with 1 medial spine, 1 long and 2 short terminal spines; outer ramus with 2 outer marginal spines, 1 long and 1 short terminal spine. Uropod 2: Peduncle with 2 distal spines; inner ramus with 1 medial and 1 terminal spine; outer ramus with 2 terminal spines. Uropod 3: Peduncle stout with 1 mediodorsal spine and 1 distoventral spine; rami lancolate, inner slightly wider than outer, each with a medial outer marginal spine. Telson: Cleft to 60% of its length; apex of lobes medially produced, each lobe with 1 elongate terminal spine flanked on either side by a shorter spine. Gills: Present on pereopods 2–6; short and oval on pereopods 5 and 6, elongate and linear on pereopods 3 and 4.

Male.—Unknown.

Type.—Holotype, USNM 170231, female 3.18 mm and a paratype series of 13 specimens, USNM 170232.

Type-Locality.—Types from Corpus Christi Bay, Texas.

Material Examined.—Specimens from San Antonio Bay, Texas and Matagorda Bay, Texas as well as the types.

Distribution.—Gulf of Mexico, Texas coast, depth: 2–5 m.

Relationships.—*Listriella bahia* appears very close to *L. clymenellae* from the east coast of North America. Both species have similar appendages and armament of the gnathopods. *Listriella bahia* differs in having a produced anterior head lobe and a more excavate palm on gnathopod 2.

Listriella carinata new species

Figures 6, 7, 8

Description.—Female 3.25 mm. Head with produced cephalic lobes, eyes with ommatidia loosely organized; pleonite 1 and urosomite 1 with single carina, pleonites 2–3 with trifid carina. Upper Lip: Broadly rounded. Mandible: Molar reduced to bump with 2 spines; accessory blades 3 with lacinia mobilis on each mandible, left larger; incisor produced; palp with 3 articles, length ratios of 13:15:13, article 2 with ventromarginal and distal setae, article 3 with a row of complex, medioventral spines grading into elongate setae. Lower Lip: Presence of inner lobes indeterminate; outer lobes widely separated. Maxilla 1: Inner plate reduced with 2 terminal spines; outer plate with 6 terminal spine teeth; palp biarticulate; inner margin of second article spinose with 2 mediofacial setae. Maxilla 2: Inner plate with 2 inner marginal and 4 terminal setae; outer plate with

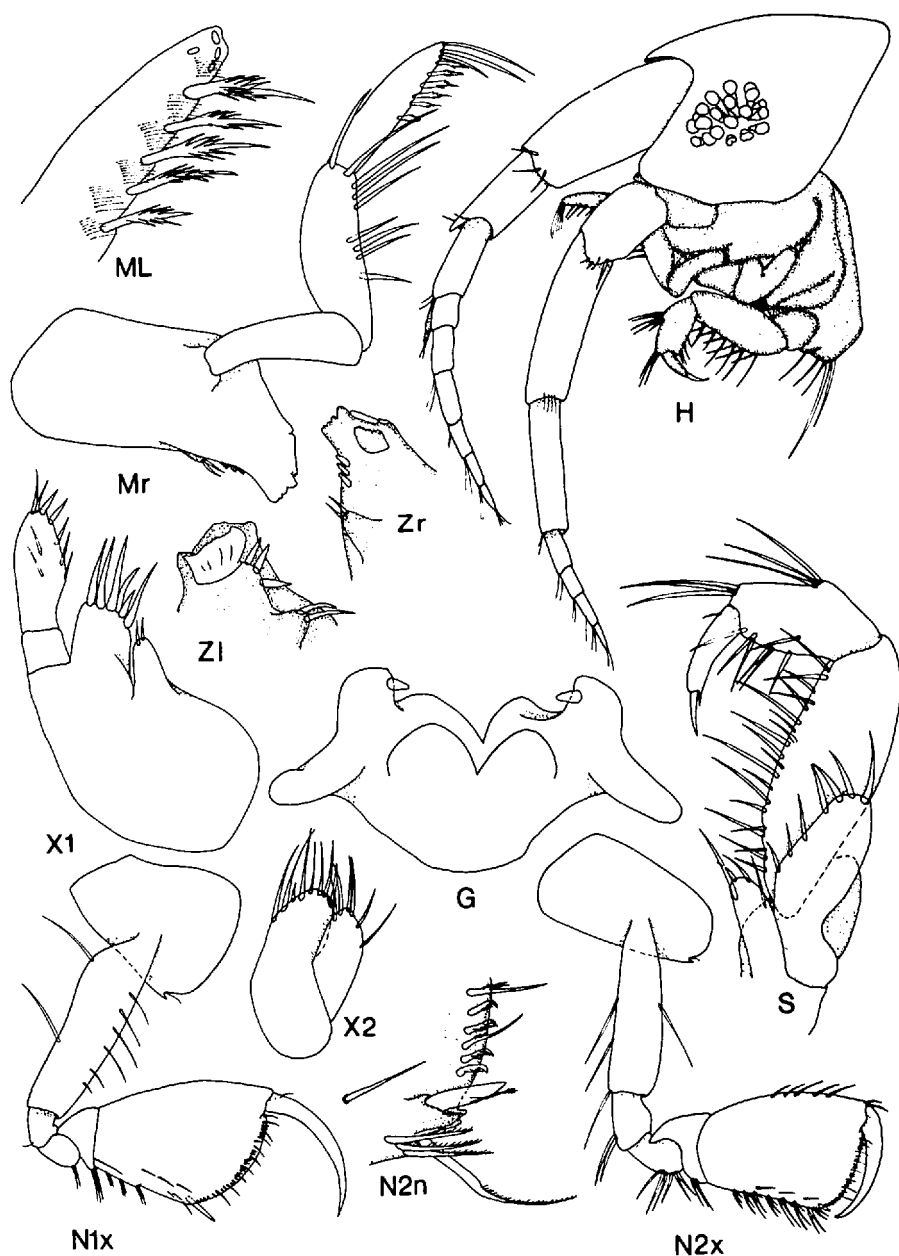


Figure 7. *Listriella carinata* new species, female 3.25 mm.

terminal setae. Maxilliped: Inner plate reduced, with 3 terminal setae; outer plate 2 times the width of inner with 3 inner marginal and 4 terminal spines; palp enlarged, article 2 with inner marginal setae, article 3 with 2 groups of 3 elongate outer marginal setae, inner margin lined with setae, article 4 with accessory nail. Gnathopod 1: Coxa distally expanded, posterodistal corner with cusp; article 6 distally expanded, palm 8 times the length of the article, palm lined with short spines and corner defined by a single long spine; dactyl attenuate. Gnathopod 2: Coxa narrowing distally, posterodistal corner with 1 cusp; posterodistal edge of

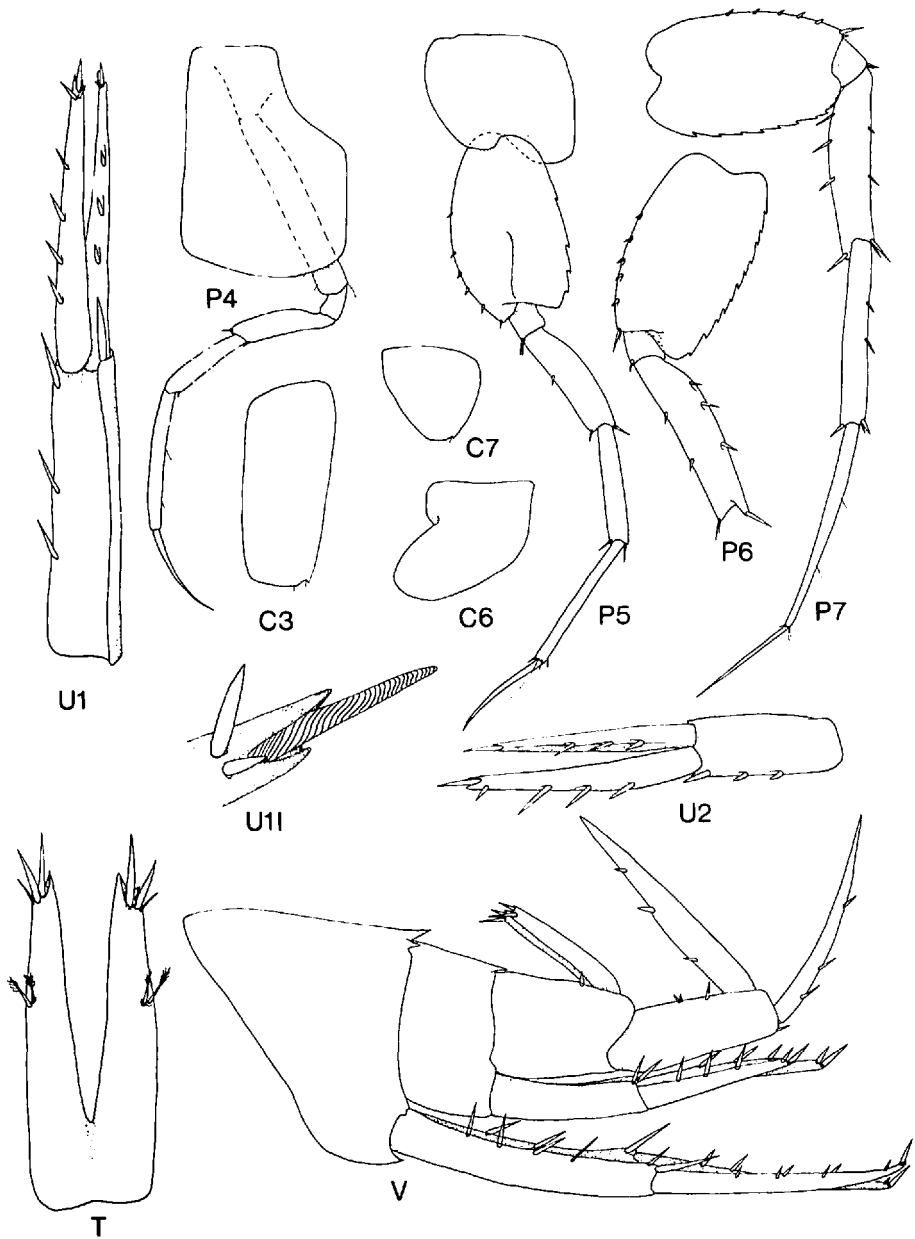


Figure 8. *Listriella carinata* new species, female 3.25 mm.

articles 4 and 5 setose; article 6 subquadrate, anterior edge with setae row, posterior margin with a row of clumped setae; palm transverse, corner defined by one spine; dactyl attenuate. Pereopod 3: Coxa 2.4 times as long as wide, quadrate with posterodistal cusp; articles 2–3 linear, poorly armed; articles 3–7 with length ratios of 80:10:38:38:57. Dactyl attenuate. Pereopod 4: Coxa quadrate, posterior margin excavate; otherwise like pereopod 3. Pereopod 5: Coxa bifid, wider than long; article 2 with posterior lobe, anterior margin with 6 short spines, posterior

margin distally serrate; remaining articles linear, anterior margin of article 4 with medial spine, others distally armed; dactyl attenuate. Pereopod 6: Coxa produced posteriorly; article 2 expanded posteriorly, anterior margin with 7 spines on either edge; remaining articles as in pereopod 7 but slightly shorter and less stout. Pereopod 7: Coxa with slight posterodistal cusp; article 2 expanded, anterior margin with 7 spines, posterior margin serrate; article 4 with 4 anterior and posteromarginal spines; article 5 with 2 anteromarginal and 3 distal spines; length ratios of articles 4–7—67:76:89:47; dactyl attenuate. Epimera: Epimeron 1 with 3 plumose anterodistal setae, 2 spines; epimeron 2 with 2 mediolateral spines; hind corner of epimeron 3 toothed and produced. Uropod 1: Peduncle with 3 inner and 5 outer marginal spines and 1 distolateral spur; rami elongate, inner ramus with 4 marginal spines and 3 terminal spines—2 short flanking and 1 striate terminal spines; outer ramus with 3 marginal and 3 terminal spines. Uropod 2: Peduncle with 3 inner marginal spines; outer ramus slightly shorter than inner; inner ramus with 4 marginal and 1 terminal spines; outer ramus with 3 marginal and 1 terminal spines. Uropod 3: Peduncle elongate with 3 dorsal spines; rami lanceolate with 3 marginal spines. Telson: Elongate, cleft to 75% its length; each lobe with 2 terminal spines and 1 pair of medial setules. Gills: Present on pereopods 3–6 and gnathopods 2. Oostigites: Present on pereopods 3–5 and possibly 6 and gnathopod 2, but much reduced and poorly developed.

Male.—Unknown.

Type.—Holotype, USNM 170233, female 3.25 mm.

Type-Locality.—Type from 29°0'N 95°30'W, waters off Galveston Island, Texas.

Material examined.—Three specimens from 27°55'N 96°20'W and Dream Bank, 27°05'N 97°20'W.

Distribution.—Gulf of Mexico, Texas Coast, depth: 10–20 m.

Relationships.—The relationship of this species to other *Listriella* is not clear. The attenuate pereopods are somewhat similar to *L. melanica* J. L. Barnard, 1959, but it differs in most other respects. This is a particularly rare species of which only 4 specimens have been found.

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